
A NOTE UPON THE FOOD HABITS OF ADULT TENTHREDINIDÆ.

Whilst collecting insects on the 13th of May, 1913, I was interested to observe an adult *Tenthredo variegatus* engaged in feeding upon the remains of a small Dipterous insect, and was fortunately able to secure the specimen alive and unharmed.

I kept it in confinement for some days and was able to make some observations upon the feeding habits of this species.

It was found to feed greedily upon house flies, which were seized with great violence as soon as they were introduced into the jar in which the *Tenthredo* was confined. A wound was then made in the body, into which the mouth parts were introduced and the contents of the body consumed.

On some occasions an attempt was made to drag the fly from the forceps, which were used to place it in the jar, the saw-fly shewing great excitement, constantly dashing about and jerking its legs and wings in the manner of certain predaceous wasps.

The above note is offered as a contribution to a subject upon which I believe little is at present definitely known.

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NEW OR LITTLE KNOWN SPECIES OF APHIDIDÆ.

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(Continued from Page 87.)

Myzus circumflexum (Buckton).

(*Siphonophora circumflexa* Buckton).

(*Myzus vinæ* Gillette).

This beautiful *Myzus* was first reported in this country by Mr. F. A. Serrine,* who found it attacking calla lily, cyclamen "dusty miller" (*Senecio cineraria*) and *Spiraxis* in greenhouses, it being especially troublesome to the calla. Prof.

*14th Ann. Rept. N.Y. Agric. Expt. Station, 1896, p. 603.
April, 1914

C. P. Gillette has reported it from liliaceous plants, asparagus fern, *Aquilegia*, *Rumex* sp., and *Vinca* in greenhouses, while the writer has found it common and often injurious to such greenhouse plants as *Vinca*, Asparagus fern, *Adiantum hybridum*, and calla lily, at Chicago, Ill. Specimens of this aphidid have been received from Prof. R. H. Pettit, who collected it on calla lily and *Freesia* in greenhouses at East Lansing, Mich. Recently (February 1, 1913) the writer found this species very common on sprouts of various plants in the cold plant room of the Botany Department of the Purdue Agricultural Experiment Station at La Fayette, Ind. Here it was found breeding abundantly on the following plants: *Anemone cylindrica*, *Aquilegia canadensis*, *Arabis*, *Artemisia dracunculoides*, *Aster dumosus*, *A. multiflorus*, *A. paniculatus*, *Cirsium flormanii*, *Malvastrum coccineum*, *Polymnia canadensis*, *Rumex obtusifolius*, *Sambucus canadensis*, *Senecio (foliosa) serra* (?) (so labeled), *Steironema lanceolatum*, *Vicia nuttallii*. It was also breeding on the following, but not so abundantly: *Aquilegia flavescens* (so labeled), *Ranunculus acris*, *Rubbeckia laciniata*, and *Solidago missouriensis*. From this it will be seen that this species is capable of living and breeding on a large variety of plants, and in this respect, as well as in its habits, it resembles *Myzus persicae* (in greenhouses) and, in fact, the two species are not infrequently found intermingled in the same colonies. Even in the cold plant room just mentioned, where during the past winter the temperature was often as low as 40° F., no sexual forms were observed.

We have recently received specimens of this species from Dr. Albert Tullgren of Sweden, and are able to identify our American forms as the same as the European. It has, so far as we are able to learn, always been referred to the genus *Macrosiphum* by European students of Aphididae, but it is without doubt a typical member of the genus *Myzus*.

For a complete description of this species see Prof. Gillette's paper on "New Species of Colorado Aphididae, with notes upon their life-habits," in the Canadian Entomologist, volume 40, page 19, 1908.

Myzus lycopersici (Clarke)*(Macrosiphum lycopersici* Clarke.)

This species was first identified by Mr. H. F. Wilson as *Macrosiphum lycopersici* Clarke, from specimens collected on wheat and tomato in Montana, sent him by Prof. R. A. Cooley. The Clarke collection of Aphididæ, which contained all his type specimens, was destroyed in the San Francisco earthquake and fire, and consequently it was not possible positively to identify the species. The fact that the original description of this species agrees fairly well with the species here described, that it was found not uncommon on tomato, the type host, and that it has been found by Mr. Wilson in Oregon, where the fauna is not unlike that of the northern half of California, tend to establish the identity of this species beyond little doubt.

Wingless viviparous female.

(Pl. V, fig. 26.)

Entire body pale lemon-yellow, the head usually whitish yellow, with a more or less distinct longitudinal dorsal median line of pale green colour; also, an area at base of cornicles of a deeper yellow is usually discernible, and often one or more of the red eyes of the young within show through the body wall. Antennæ having segments I and II concolorous with head; the remaining segments whitish semitransparent, excepting a faint duskiness at tips of III and IV, the tips of V and of base of VI and the distal third of filament of VI blackish; segments III and filament of VI subequal; total length less than that of the body; one or two circular sensoria near base of segment III and the usual distal ones on V and base of VI. Eyes very dark reddish brown, apparently black under hand lens. Beak not quite reaching to coxæ of second pair of legs. Legs whitish, the tips of tibiæ brownish and the tarsi dusky to blackish. Cornicles whitish yellow and semitransparent; cylindrical, and reaching a little beyond tip of cauda. Cauda pale yellow or greenish yellow, paler than body colour.

Average measurements from 8 individuals, alive and in balsam, as follows: Length of body, not including cauda, 1.90 mm.:

length, including cauda, 2.05 mm.; width, 0.83 mm.; length of cornicle 0.42 mm.; cauda 0.26 mm.

Antennal measurements as follows:

Locality, Date, Etc.	I. mm.	II. mm.	III. mm.	IV. mm.	V. mm.	VI. (base) mm.	VI. (fil.) mm.	Total mm.
La Fayette, Ind. (Idaho specimens*) Wheat, Aug. 23, 1912.....	0.104	0.069	0.504	0.330	0.332	0.148	0.522	2.009
La Fayette, Ind. (Idaho specimens*) Wheat, Aug. 23, 1912.....	.104	.069	.539	.348	.313	.148	.522	2.043
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912.....	....	....	.495	.313	.278	.130	....	....
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912.....	.104	.078	.504	.304	.261	.139	.487	1.877
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912.....	....	....	.470	.304	.243	.139	.435	....
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 24, 1912.....	....	....	.487	.261	.226	.139	.444	....
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912.....	.096	.069	.495	.330	.269	.139	.495	1.893
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912.....	....	....	.504	.296	.278	.130	.504	....
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912.....	.096	.069	.461	.261	.261	.139	.452	1.739
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912.....	.087	.069	.478	.269	.269	.139	.470	1.781
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912.....	.096	.069	.487	.296	.206	.148	.504	1.896
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 9, 1912.....	.069	.069	.487	.304	.296	.148	.487	1.887
New Richmond, Ind., Oats, Nov. 9, 1912, Female producing.....	.104	.069	.504	.365	.296	.139	.539	2.016
New Richmond, Ind. Oats, Nov. 9, 1912, Female producing.....	.104	.069	.522	.382	.313	.139	.574	2.103
New Richmond, Ind. Oats, Nov. 9, 1912, Female producing.....	....	....	.487	.330	.278	.139	.495	....

* Measurements from living specimens.

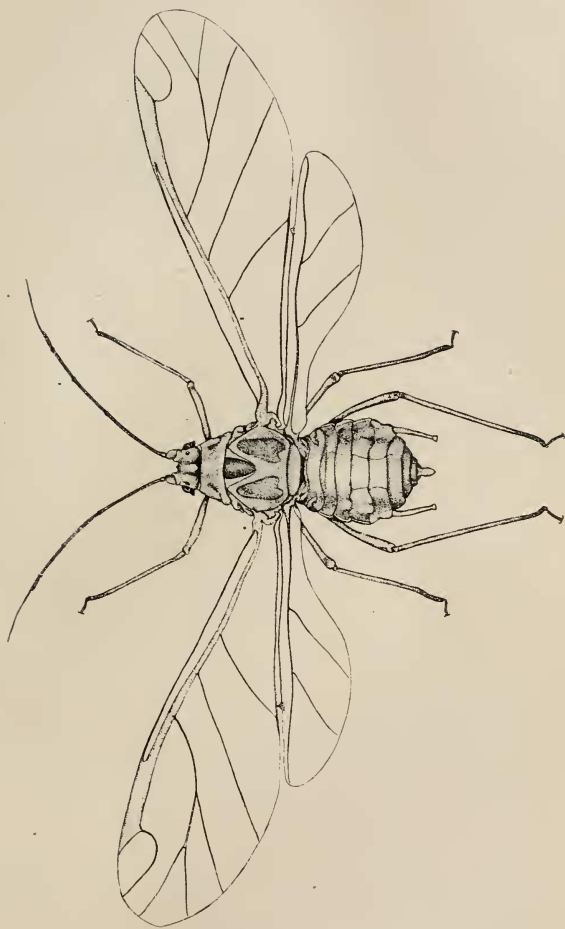


FIG. 14.—*Myzus lycopersici*, winged viviparous female.

Winged viviparous female.

(Fig. 14 and Pl. V, figs. 27-30).

Head pale yellow, with a slight dusky tint near posterior border; the antennal tubercles typical of the genus *Myzus*. Antennæ with segments I and II whitish with a slight yellowish tint, II sometimes faintly dusky, III with extreme base pale and the remainder blackish, IV and V pale with dusky to blackish tips, base of VI blackish and filament of VI pale with blackish tip (in some specimens the entire antenna excepting segments I, II and extreme base of III is blackish); segments III and filament of VI subequal, sometimes the one and sometimes the other being larger; total length less than that of the body; segment III with 18 to 26 circular sensoria, and the usual distal ones on segments V and base of VI. Eyes dark reddish brown, almost black. Ocelli bordered with conspicuous dark wings. Beak reaching only a little beyond coxæ of the first pair of legs. Thorax yellowish, with the thoracic plates yellowish brown and their apices of a darker tint. Wing veins pale brownish and narrow, branching as shown in illustration. Femora whitish, with a faint yellowish or greenish tint, the tip dusky; tibiæ pale brownish with blackish tip; tarsi blackish. Abdomen pale lemon-yellow and with a longitudinal, dorsal median line of a pale green colour, which is often more or less inconspicuous; sometimes the fall forms show three very faint dull-yellowish spots on each side of abdomen, anterior to the cornicles. Cornicles whitish, with a faint yellowish tint and semitransparent, reaching a little beyond tip of cauda, cylindrical and very slightly flaring at tip. Cauda pale yellow, slightly paler than body colour.

Average measurements from 15 individuals in balsam as follows: Length of body, not including cauda, 1.8 mm.; length, including cauda, 1.9 mm.; width 0.66 mm.; length of wing 3.6 mm, width 1.3 mm.; length of cornicle 0.43 mm., of cauda 0.22 mm. Antennal measurements as follows:

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ments)	Total.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
703. Bozeman, Mont., celery Aug. 30, 1911, J. R. Parker.	0.104	0.087	0.636	0.539	0.490	0.165	0.531	2.582
703. Bozeman, Mont., celery Aug. 30, 1911, J. R. Parker.	.104	.087	.713	.487	.417	.165	.574	2.547
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.078	.631	.417	.365	.156	.556	2.337
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.087	.643	.400	.331	.156	.574	2.355
709. Bozeman, Mont., tomato Aug. 30, 1911, J. R. Parker.	....	.087	.613	.470	.383	.156	.631	....
703. Bozeman, Mont., tomato Aug. 30, 1911, J. R. Parker.	....	....	.626	.487	.383	.156	.613	....
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.087	.748	.522	.435	.165	.687	2.748
707. Bozeman, Mont., wheat Aug. 26, 1912, H. F. Dietz.	.104	.087	.765	.530	.413	.165	.721	2.815
Shoshone, Idaho, oats, July 18, 1912, T. H. Parks.	.104	.087	.530	.400	.348	.153	....	....
Shoshone, Idaho, oats July 18, 1912, T. H. Parks.	....	....	.504	.348	.296	.148	.530	....
La Fayette, Ind. (Idaho specimens), Wheat, Aug. 9, 1912.....	.036	.070	.522	.353	.304	.156	.518	2.052
La Fayette, Ind. (Idaho specimens) Wheat, Aug. 9, 1912.....	.036	.078	.522	.318	.287	.148	.553	2.035
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.087	.574	.400	.365	.156	.574	2.260
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.087	.531	.435	.365	.165	.600	2.347
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.078	.635	.417	.374	.153	.531	2.364
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 10, 1912.....	.104	.078	.613	.400	.365	.156	.582	2.346
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	.104	.087	.600	.435	.383	.165	.600	2.383
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	.036	.078	.582	.461	.400	.153	.574	2.347
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 11, 1912.....	....	....	.622	.443	.383	.165	.600	....
La Fayette, Ind. (Idaho, specimens) Wheat, Oct. 11, 1912.....	....	....	.591	.435	.383	.153	.531	....

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ments)	Total.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912. . . . .	.113	.078	.696	.513	.400	.174	.643	2.617
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912. . . . .	....	....	.748	.508	.417	.165	.626	....
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912. . . . .	.121	.087	.713	.522	.365	.165	.643	2.616
La Fayette, Ind. (Idaho specimens) Wheat, October, 1912. . . . .	.113	.078	.730	.504	.383	.165	.600	2.583
La Fayette, Ind. (Idaho specimens), Wheat, Oct., 1910, female producing oviparous females. . . . .	.104	.087	.591	.400	.339	.148	.533	2.208
La Fayette, Ind. (Idaho specimens), wheat, Oct., 1910, female producing oviparous females. . . . .	.104	.078	.591	.417	.348	.148	.530	2.216
La Fayette, Ind. (Idaho specimens), wheat, Oct., 1910, female producing oviparous females. . . . .	.096	.078	.522	.348	.313	.148	.522	2.027
La Fayette, Ind. (Idaho specimens), wheat, Oct., 1910, female producing oviparous females. . . . .	.104	.078	.504	.356	.313	.148	.522	2.025

Pupa of Male:

Entire body pale yellowish or cream colour, the abdomen with a faint pink tint in the ground colour. Neck with a decided pink tint. Abdomen with a longitudinal dorsal median area of deep pink, the anterior end of which terminates in a diffused pink area, this extending on to the thorax. Antennæ whitish, excepting V, base of VI and filament of VI (except central area of this segment), which are dusky to blackish. Eyes dark red. Legs whitish, excepting tarsi, which are blackish. Cornicles whitish.

Winged male.

(Fig. 15, Pl. V, fig. 31.)

Head pale at anterior portion, becoming dusky to brownish posteriorly. Antennæ with segments I and II whitish with a slight duskiess, the remaining segments blackish to black; from 48 to 59 circular sensoria, irregularly placed, on III, none on IV, 6 to 10 on V, not including the usual distal one, more or less in a row and



FIG. 17. *Myzus lycopersici*, winged male.

usually on distal half of segment, the usual distal ones on base of segment VI; segments III and filament of VI subequal, the latter usually being slightly the longer; total length greater than that of the body. Eyes dark red; ocelli marked with dark rings. Thoracic lobes brownish or olive brown. Wings with fine blackish veins, the venation as for the viviparous female. Legs pale, excepting tips of femora, bases and extremities of tibiae, and the tarsi, which are dusky to black. Abdomen pale pinkish, with the longitudinal dorsal median area darker and rather conspicuous; the area at base of cornicles yellowish; on each side, anterior to the cornicles, not visible from the dorsal aspect, are three dark spots. Cornicles whitish, semitransparent, with a yellowish tint basally, cylindrical, reaching to or slightly beyond tip of cauda. Cauda pale yellow or cream colour.

Average measurements from 9 individuals mounted in balsam: Length of body, not including cauda, 1.63 mm.; length, including cauda, 1.80 mm., width 0.59 mm.; length of wing 3.6 mm, width 1.35 mm.; length of cornicle 0.36 mm.; length of cauda 0.17 mm. Antennal measurements as follows:

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ment)	Total.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
New Richmond, Ind., oats, Nov. 15, 1912.....	0.104	0.087	0.714	0.539	0.487	0.191	0.730	2.852
New Richmond, Ind., oats, Nov. 15, 1912.....	.069	.087	.678	.452	.407	.165	.661	2.546
New Richmond, Ind., oats, Nov. 15, 1912.....	.096	.087	.661	.452	.435	.165	.669	2.565
New Richmond, Ind., oats, Nov. 15, 1912.....	.096	.070	.591	.424	.383	.156	.678	2.398
New Richmond, Ind., oats, Nov. 15, 1912.....	.096	.070	.591	.417	.372	.165	.626	2.337
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912.....	.104	.070	.650	.435	.435	.156	.678	2.528
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912.....	.104	.078	.591	.417	.407	.165	.609	2.371
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912.....	.104	.078	.591	.435	.407	.156	.652	2.423

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ment)	Total.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
La Fayette, Ind. (Idaho specimens) Wheat, Oct. 21, 1912. ....	.087	.070	.617	.389	.383	.148	.626	2.319
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912. ....	.087	.070	.685	.459	.435	.174	.696	2.606
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912. ....	.087	.070	.678	.452	.435	.156	.696	2.574
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912. ....	.087	.070	.643	.383	.400	.156	.635	2.374
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 1, 1912. ....	.096	.070	.626	.400	.365	.156	.626	2.339
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 15, 1912. ....	.104	.070	.730	.522	.495	.191	.748	2.860
La Fayette, Ind. (Idaho specimens) Nov. 15, 1912. ....	.104	.070	.713	.522	.495	....	....	....

Wingless oviparous female.

(Fig. 16, Pl. V, fig. 32, and Pl. VII, fig. 33.)

Head and prothorax white, remainder of body a pale cadmium yellow, the last two abdominal segments paler yellow. Antennæ

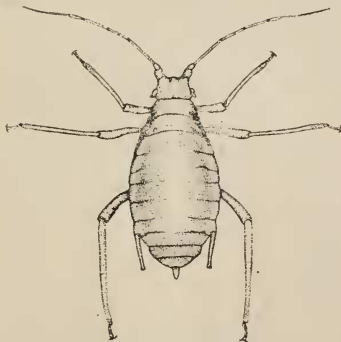


FIG. 16.—*M. lycopersici*, wingless oviparous female.

having segments I and II concolorous with head, the remaining segments whitish transparent, excepting tips of IV, V, base of VI and distal third of filament of VI, which are dusky; filament of segment VI the longest, being invariably longer than III; total length less than that of the body; segment III with 1 or 2 circular sensoria near base (some specimens appear to have this segment

bare of sensoria) and the usual distal ones at tips of V and at base of VI. Eyes blackish. Beak just reaching to coxæ of second pair of legs. Legs whitish transparent, excepting tips of tibiæ, which are dusky, and the tarsi, which are blackish. Hind tibiæ swollen and bearing 75 or more irregularly placed circular sensoria. Cornicles whitish transparent, not quite reaching to tip of cauda in fully matured individuals. Cauda pale to whitish green.

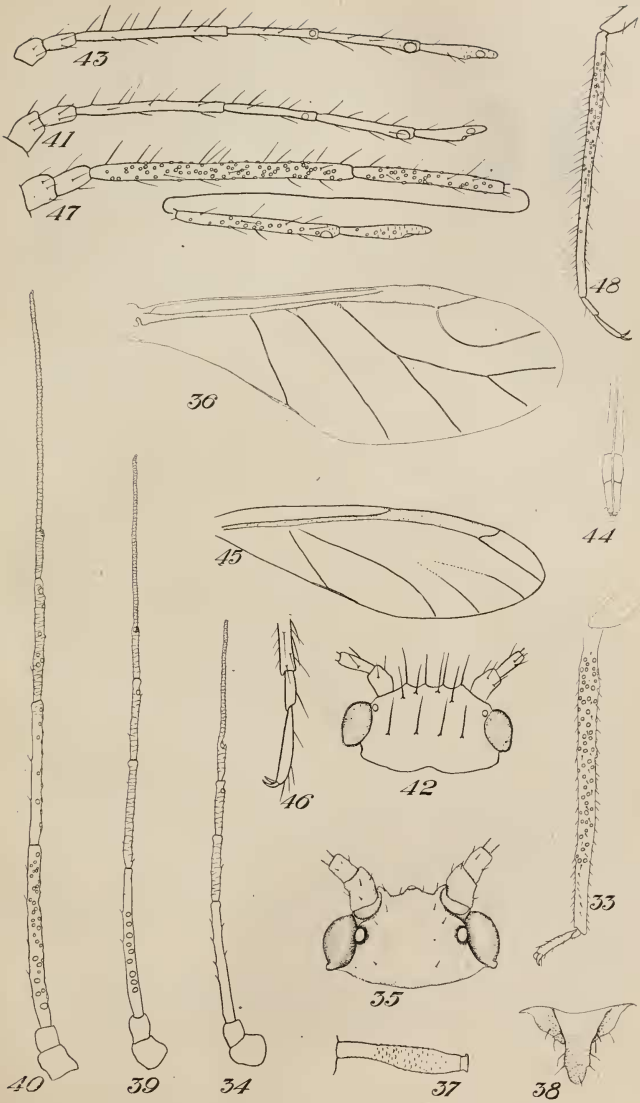
Average measurements from 5 individuals mounted in balsam: Length of body, not including cauda, 1.38 mm.; length to tip of cauda 1.48 mm., width 0.61 mm.; length of cornicle 0.295 mm.; length of cauda 0.16 mm. Antennal measurements as follows:

Locality, Date, Etc.	I.	II.	III.	IV.	V.	VI. (base)	VI. (fila- ment)	Total.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
La Fayette, Ind. (Idaho specimens) Wheat, Dec. 2, 1912 .....	.....	.....	0.313	0.174	0.165	0.122	0.339	.....
La Fayette, Ind. (Idaho specimens) Wheat, Dec. 2, 1912 .....	.087	.070	.296	.191	.191	.113	.391	1.339
La Fayette, Ind. (Idaho specimens) Wheat, Dec. 2, 1912 .....	.087	.070	.296	.200	.200	.113	.400	1.366
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.330	.243	.209	.113	.383	1.435
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.356	.243	.209	.113	.409	1.478
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.278	.209	.226	.104	.374	1.339
La Fayette, Ind. (Idaho specimens) Wheat, Nov. 20, 1912 .....	.087	.061	.287	.191	.217	.122	.400	1.365
New Richmond, Ind. Wheat, Nov. 9, 1912 .....	.087	.061	.348	.252	.209	.113	.417	1.487

Egg.

(Fig. 17.)

The egg when first laid is pale yellowish green colour, later changing to jet black. It measures 0.0678 mm. by 0.3304 mm.



NEW AND LITTLE KNOWN AFHIDIDAE

During oviposition, which requires 14 minutes for the deposition of a single egg, the female holds the cauda perpendicular to the body.



FIG. 17.—*M. lycopersici*,
egg.

This interesting species was first received from Mr. T. H. Parks, of this Bureau, who found it quite common on oats, first at Shoshone, Idaho, July 18, 1912, and later at Blackfoot and Idaho

Falls, Idaho, August 7, 1912. The same species was received from Mr. E. J. Vosler, who collected it on oats at Salt Lake City, Utah. Later in the year (October 8) the writer found the pupæ of viviparous females, as well as wingless viviparous females, which were giving birth to the beautiful and conspicuous pinkish males, in abundance on volunteer oats near an elevator at New Richmond, Ind. Specimens collected at Bozeman, Mont., in August of 1911 and 1912 on wheat, tomato, and celery were received from Prof. R. A. Cooley and Mr. H. F. Dietz. Mr. Dietz informs me that they also found the pinkish males on wheat at the same time, although it was not known then that they and the pale yellow forms on the same plant were specifically identical.

In rearing cages at La Fayette, Ind., pink and yellow young were obtained from wingless viviparous females. The former became winged males, while the latter became winged viviparous females, which in turn gave birth to oviparous females. The winged males were quite restless in the cages containing wheat plants, as were also the sexuparæ, and it was only rarely that the latter could be induced to give birth to an oviparous female on the wheat plants, although most of those born there did feed and mature on the wheat. Mr. Dietz states that in August, at the time his collections were made, the winged forms were apparently migrating to some unknown host. The same was true at New Richmond, Ind., where the species was found in abundance on oats. Thus it seems quite probable that the males and the winged viviparous females (sexuparæ) migrate to some unknown host in the fall of the year, where the oviparous females are born and the winter eggs deposited.

Besides the plants enumerated above, we have reared this species through several generations in the insectary on rye.

(To be continued.)